Memo to: Westex Committee February 22, 1960

From: N. H. Horowitz

Subject: Back-contamination and the goals of space biology.

The following paragraphs, representing my views on the above subject, are based on a recent exchange of letters with Josh Lederberg. Your reactions to these proposals would be helpful to Josh in connection with coming SSB meetings. Please send any comments to Josh, with a copy to me.

At the last Westex meeting, concern was expressed over the possibility that returning spacecraft might contaminate the earth with dangerous micro-organisms of extra-terrestrial origin. This viewpoint is incorporated in the draft version of the excellent paper presented at Nice by Lederberg, a copy of which you have received. I happen to disagree with this viewpoint. To my mind, it is both useless and harmful to recommend a policy of embargo on returning spacecraft. It is useless because the danger is negligible and because, in any case, the embargo policy is not the correct way to deal with whatever hazard may exist. It is harmful because this policy would defeat what should be the primary goal of space biology: to obtain samples of the lunar and planetary surfaces (uncontaminated by earth organisms) for examination in terrestrial laboratories at the earliest possible moment.

The belief that back-contamination of the earth represents a real danger rests on three improbable assumptions: (a) that microorganisms will be found on the planets, (b) that they are dangerous to man, and (c) that we would be unable to cope with them if they escaped. The product of these three terms is, in my opinion, so much smaller than anything else we have to consider--in particular, the danger of our contaminating the planets--that it should not be permitted to influence decisions regarding the timing of return flights. As my colleague A. H. Sturtevant put it recently in a conversation, it would make more sense to declare an embargo on material from the Antarctic.

Even granting the remote possibility of a hazard, is an embargo policy the correct way to deal with it? I think it is not. It is exceedingly doubtful that we would be able to recognize and evaluate--let alone learn how to cope with--whatever harmful organisms may exist on the planets without actually having them in our hands. Even under the best of conditions, telemetered information from space probes will not answer all of our questions or remove all our doubts. We should recognize the fact that definitive information on the biological composition of the lunar and planetary surfaces will come only from laboratory studies of soil samples brought back from these bodies. If we insist on pursuing an embargo policy until we are certain there is no risk, then we shall never know whether there is a risk or not.

Against the slight hazard, one must weigh the potential benefits to mankind of unhampered traffic with the planets. The present situation can be likened to that which obtained in Europe in the decade before Columbus set forth on his voyage of discovery. If men had known then that Columbus would bring back with him a disease--syphilis--that was to plague Europe for centuries, they might have prevented him from ever leaving Spain. Suppose, however, that they had known also of the benefits that were to flow from the discovery of the New World. Can there be any doubt what their decision would have been then?

For the above reasons, it would be inadvisable, in my opinion, to adopt a position--e.g., an embargo on returning spacecraft--which might prejudice the development of the necessary technology for return flights. Also to be considered is the probably deleterious effect on public opinion of an excessively cautious policy. (By this I mean that the public may be frightened out of any interest in space explorations). Rather, we should recognize that we will not obtain the kind of scientific information we want about the chemical and biological nature of the planetary and lunar surfaces if we are not permitted to bring back soil and dust samples. In my opinion, the procurement of such samples should be the primary goal of exobiological research. It should be understood that the biological exploration of the planets by instrumented payloads is not a substitute for this primary objective, but is only a temporary measure for obtaining some scientific information during the period before return flights are feasible.